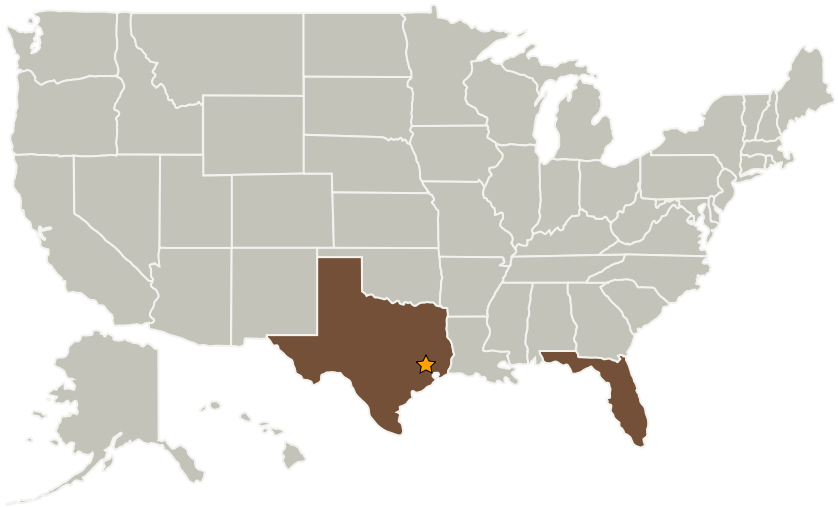
A New Wick Structure to Significantly Improve Heat Pipe Performance, Phase I

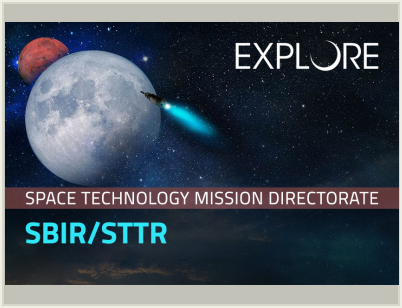
Completed Technology Project (2006 - 2006)

Project Introduction

Increasing thermal requirements for space-based thermal control systems are straining the capabilities of conventional heat pipes. Mainstream has experimentally demonstrated a new wick configuration that has been shown to more than triple the heat transport capacity of an otherwise identical copper water heat pipe(this proposal contains the experimental data). This Phase I will seek to extend these heat pipe experiments. Improved heat pipe technology is relevant and important to meeting thermal technology needs; it is well known that any means to improve heat pipe capacity widens the potential applications for their use. Extending the capability of a simple, highly reliable passive system means more applications where this passive heat pipe approach can be used instead of the more complex, and potentially less-reliable, active systems. This Phase I includes heat pipe experiments and limited performance optimization. Mainstream has already performed the marketing and commercialization studies, and we have secured a commercial aerospace partner (with funding) for a follow-on commercialization effort. Phase III commercialization would parallel our other SBIR commercialization efforts. Mainstream's prior record of accomplishment has demonstrated that we are very serious about commercialization and our DoD commercialization index is 90%.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Mainstream Engineering Corporation	Supporting Organization	Industry	Rockledge, Florida

Primary U.S. Work Locations	
Florida	Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.2 Thermal Control Components and Systems
    - TX14.2.2 Heat Transport